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ABSTRACT

This document reviews the literature on general specifications for elementary and secondary schools. Most of the reviewed reports recommend a sequence of activities for developing school facilities that includes: (1) formulation of educational objectives, (2) school plant survey, (3) architectural involvement and planning, (4) program implementation, and (5) maintenance. Topics covered include the philosophical perspective required of facilities planners, individual-environment interaction, physical systems for heating and lighting, and new technological developments. (Author)

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December 1971 Number 1

# Educational Specifications

PHILIP K. PIELE

> Construction of a school building has often been relegated almost entirely to the architect and the builder. In earlier times, it was perhaps only the builder who was concerned with the actual construction. The breadth and purpose of a school building was limited to the scope of the builder or architect's vision.
>
> In any other field, such a procedure would be unthinkable. Envision a manufacturer who would tell an architect to build him a new factory without first explaining the purposes of the factory, the activities which would take place in it, the machinery which would be housed in the plant, and the interrelationships of the persons who would work in it. Can educators do otherwise?
>
> *Wilson and Saavedra ([1967])*

There is a growing awareness within the profession that apparently simple decisions concerning the structural design and maintenance of school facilities can have complex and unforeseen consequences. Buildings constructed with an emphasis on minimizing immediate costs frequently prove to be more expensive in use than anticipated. The needs of the "human elements" of our educational system cannot be taken into account as readily as the dollars and cents figures of a building-costs survey.

Two basic trends characterize the writing of specifications for school facilities. First, there is movement toward greater diversification of educational programs for small groups and individual learning situations. Second, to facilitate an increasingly individualized and flexible educational process, more attention is being devoted to the specific physical aspects of the school environment. There is evidence that tomorrow's school will provide maximum alternatives for innovative decision-making by every segment of the school community.

Many of the reports reviewed here overlap in their discussions of the philosophical and psychological perspectives required of the administrator who contemplates either new facilities or the remodeling of existing structures. Additional overlapping occurs in the sequence of activities recommended for the writing of educational specifications and their subsequent implementation. For this reason, a survey of the steps in a "school facilities development sequence" is provided to avoid repetition.

Many of the documents specify in detail the physical systems required to provide adequate lighting, heating, and ventilation. Others concentrate on the relationships among different areas of the school plant and discuss recent technological developments in interior partitions, maintenance techniques, and the like. All the literature reflects an active concern in bringing the architect into a more intimate association with the developmental processes of educational planning.

This review discusses only those reports pertaining to general specifications for elementary and secondary schools. Future reviews will focus on separate spaces within the school facility, such as libraries, language laboratories, science facilities, and vocational and technical training shops.

All except three of the documents are available from the ERIC Document Reproduction Service. Complete instructions for ordering documents are given at the end of the review.

## General Specifications

Englehardt (1968) identifies the desirable school plant as one that provides a physical environment where learning and teaching can proceed at the maximum rate. He details the entire facilities development sequence, stressing the importance of relating the maintenance step to those preceding. In addition, he describes the major objectives in school plant planning as spatial adequacy, quality, safety, aesthetics, adaptability, efficiency, and economy.

The Tennessee State Department of Education (1964) has published a set of guidelines designed to assist local superintendents with school plant planning. After summarizing the historical background of the subject, the document stresses the five steps of the facilities development sequence and their administration. The final chapter relates rules, regulations, and standards to the state of Tennessee.

Wilson and Saavedra ([1967]) present procedures and checklists for developing specifications for all phases of a school building program, concentrating in detail on the first three steps of the development sequence.

A booklet published by the Vermont State Department of Education (1966) encourages new ideas in school construction and advises local districts on the procedures and standards involved in obtaining state aid. The document emphasizes the first three steps of the development sequence and suggests guidelines for libraries, classrooms, and a variety of curriculum specialties as well as standards for a number of facilities services. An accompanying chart carries recommended minimum standards for vocational and industrial art education departments.

Cramer (1965) identifies the responsibility and role of the planners, the organization of the planning group, and the use of

### SEQUENCE OF STEPS FOR THE DEVELOPMENT OF SCHOOL FACILITIES

1. *Formulation of Educational Objectives:* A statement of the philosophy of those who will run the school is drawn up. Tentative curriculum schedules are developed based on the projected needs of the students and surrounding community. A consultant may be employed to ascertain growth trends and to establish optimum facility capacities. The area in which the new school is to be built is analyzed and potential sites are examined. At this stage the variety of buried "premises" behind educational objectives should be critically examined.
2. *School Plant Survey:* Here existing facilities are evaluated and their relevance to future needs determined. Educational objectives are related to the specifications planned for individual buildings. There specifications include detailed listings of space requirements for administrative, staff, student, and maintenance areas with a description of the activities that each will encompass.
3. *Architectural Involvement and Planning:* The site is selected and an architect is retained to translate the educational specifications into preliminary and final plans. The relationships among different areas of the building are considered and the mechanical, heating, electrical, lighting, and ventilation systems coordinated. Such factors as the interaction between individuals and their environment receive special attention at this stage.
4. *Program Implementation and Realization:* Official approval is obtained for proposed developments and the public is informed of the district's specific needs. The building is constructed, the site developed, and the necessary furniture and equipment procured. Although in actuality this step occurs long after the specifications are written, many of the documents discuss it because of its relevance to the detailed decisions that must be made in the preceding steps.
5. *Maintenance:* This stage should properly be considered throughout the development sequence because a good maintenance and operations program depends upon the forethought of the building's planners.

**Educational specifications include a detailed description of: (1) all the activities that will take place in the buildings; (2) the curriculum to be provided for; (3) specific architectural characteristics desired; (4) the facilities needed, equipment required and space relationship of these to other facilities; and (5) budget and other governing factors. The community background and history and the educational philosophy of the school district should precede the detailed specifications.**

*Texas Education Agency (1964)*

techniques and procedures in relation to the facility development sequence. He includes a sample outline for educational specifications and a format for individual courses, time requirements, and budgeting. Specifications for an elementary school, a data processing department, and a junior-senior high school include site planning, space utilization and maintenance, and operation guidelines.

The Kansas State Department of Public Instruction (1963) outlines its minimal requirements for written specifications, concentrating on the essential information an architect must have to implement interaction between educational goals and design principles. The manual lists background information, desired facilities, qualitative requirements and limitations, and outlines the development of educational specifications in conjunction with a suggested time schedule.

The problems and purposes of an educational program receive attention in a report on educational specifications published by the North Carolina State Board of Education (1968). The publication examines the various aspects of environmental interaction that compose a learning situation and discusses how the educator relates to the architect through written specifications. In addition, the document provides an outline for the educational specifications document with sample summaries of basic facts and spatial relationships.

Two reports published by the Texas Education Agency provide checklists of the responsibilities and procedures relevant to the management of a building program and describe the individual's role in the specification process. The first (1965) focuses on the preplanning aspects of steps 1 and 2 in the facilities development sequence. The second ([1968]) defines educational specifications within the context of the entire building program.

One of a series of planning guides published by the Utah State Board of Education (1966a) for its school districts relates the formulation of educational specifications to the first two steps of the facilities development sequence.

Adams (1968) reports on the Alabama State Building Commission policies and procedures established for agencies, architects, and engineers working under the commission's jurisdiction. The publication covers all school construction with the exception of mobile classroom units and outlines the general requirements and procedures for submitting plans. It emphasizes the third step of the development sequence, stressing accuracy in the communication of facts between owner and architect.

A set of educational specifications drafted by the First California Commission on School Construction Systems (1963) gives information on bidding procedures, a description of the construction program, procedures for submitting a proposal, data and conditions related to the development phase of the project, component contracts, and general conditions and procedures. Performance specifications are outlined in terms of structure, heating, ventilation, cooling, lighting-ceiling, and interior partitions. Materials are discussed in terms of cost matrices, construction timetables, and addenda to the specifications.

Drawing from a survey of the literature, Witmer (1966) outlines a general guide for the preparation of comprehensive and functional educational specifications, stressing in particular the importance of clearly stating educational objectives.

Haviland and Winslow (1970) survey

available resources to provide architects with a guide on planning and designing for educational technology.

## Elementary and Intermediate Schools

Rushton (1967) relates educational specifications to the character and quality of education for elementary schools. He describes the work of a group of teachers and administrators in the development of comprehensive specifications for their school board's deliberation. Their presentation details the first two steps in the facilities development sequence and identifies necessary equipment and general environment criteria.

Van Hoose (1965) provides a guide designed to aid architects and school personnel when relating the needs of children and elementary school programs to the first two steps of the facilities development sequence.

Two documents published by the Metropolitan Toronto School Board provide working guidelines for academic specifications and user requirements in that city's public schools. The first (1968) relates local Toronto conditions to the K-6 schools. The second (1969) focuses on the early adolescent and the cultural matrix in which the student and school system coexist, giving information concerning the development of intermediate schools.

Both documents consider in detail the first two steps of the development sequence including tables, technical data, and illustrations for all areas of the school.

The School District of Philadelphia ([1968a]) has published specifications for a new middle school in that city. The document surveys and graphically illustrates the first two steps of the development sequence.

## Secondary Schools

The Alachua County Board of Public Instruction (1966) presents the results of a team effort of committees endeavoring to determine the minimum facilities required to carry out an effective instructional program in Florida's secondary schools. Focusing on the first two stages in the development sequence, the guide considers the changes brought about in the physical dimensions of school buildings by new curricula, methods of instruction, and teaching aids. It also surveys the physical security of the schools, considering potential threats from both natural and manmade disasters. Plans and diagrams accompany the text.

Gilberts (1966) outlines the educational specifications for new secondary school plants in a Madison, Wisconsin, school district. He draws attention to the first step of the facilities development sequence, stressing the diversification of learning experiences that can be obtained through the use of a broad range of community resources. The second step of the sequence is considered in relation to specific areas where secondary school activities call for unique design features.

A school plant planning guide published by the Utah State Board of Education (1966b) relates a philosophical basis of planning to the educational needs of the secondary school student. The document considers some of the special requirements involved in carrying a building program through the first three steps of the facilities development sequence.

The Morris County Unified School District Number 417, of Council Grove, Kansas, (1966) provides a short history of its development and a comprehensive set of

educational specifications. The specifications are the result of consultations with every secondary teacher in the district and meetings with consultants provided by the state department. The space requirements in the second step of the development sequence receive particular attention.

The School District of Philadelphia ([1968b]) has published educational specifications delineating instructional space requirements for a new high school in that city. The report illustrates details of the first two steps in the sequence, including specifications for each of the school plant's twelve centers.

A report on the development of the Chelmsford Park High School (1968) outlines the use of simulation techniques to reinforce planning in the second and third steps of the sequence. By employing a physical model of the proposed school plan, educators and architects achieved maximum interaction in their discussions of the variables present in curriculum change, new course structures, and the physical environment of instructional programs.

The report suggests that concrete and steel are not suitable media for necessary future changes in the educational environment. It also provides the specifications for the Chelmsford Park High School and recommends simulation as an instructional tool. Appendixes include a section on teacher training (a system concept for developing teacher empathy), a sample community questionnaire, and the planning schedule for the proposed high school.

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